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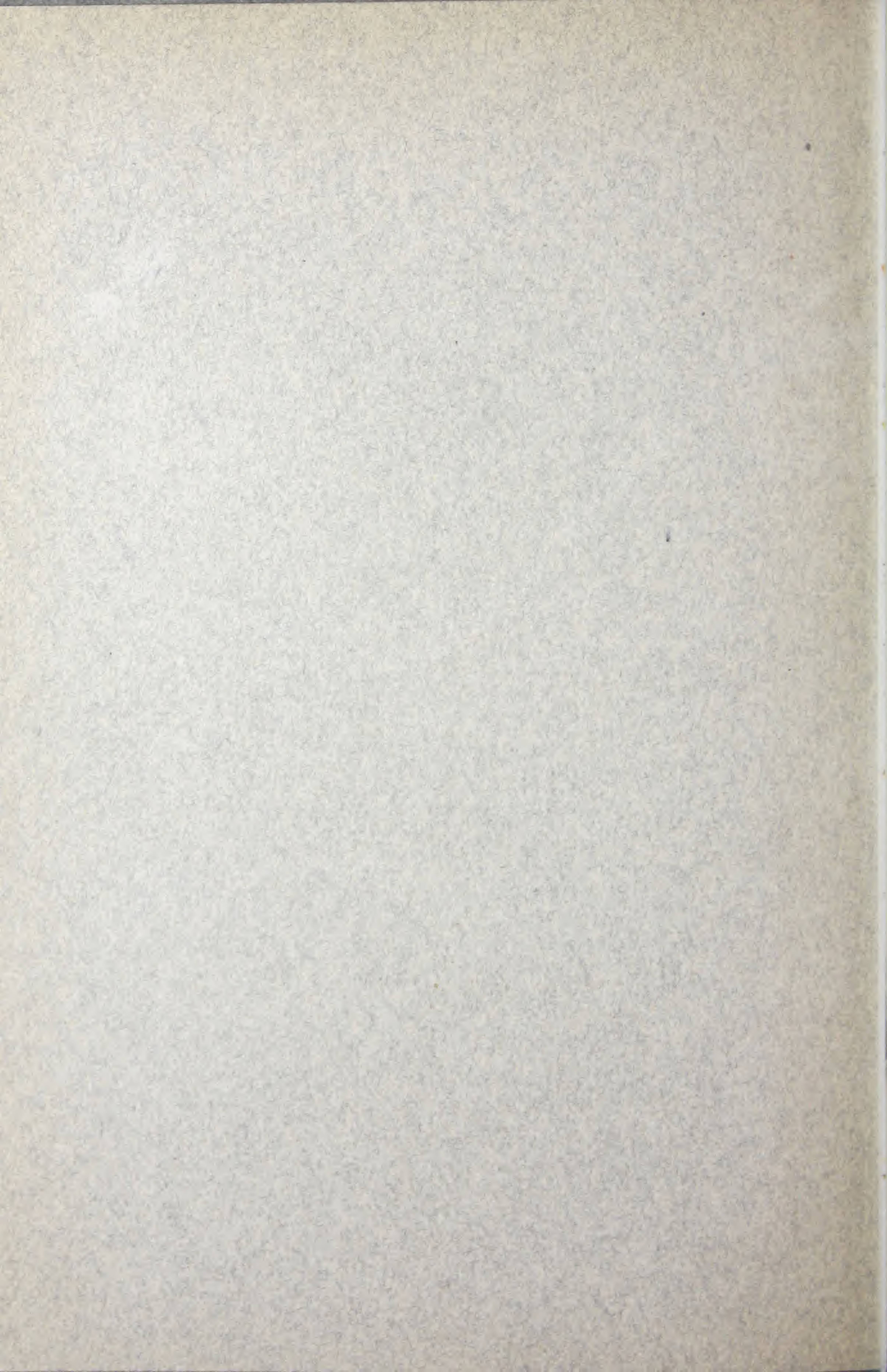
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# THE UNIT METHOD of CONSTRUCTION for

**REINFORCED  
CONCRETE  
BUILDINGS**









The Unit Method  
of Construction for  
**REINFORCED  
CONCRETE  
BUILDINGS**



**Unit Construction Co.**

ENGINEERS AND CONTRACTORS.

ST. LOUIS

New York Chicago Houston Montreal Mexico City  
San Francisco: Van Sant-Houghton Co., Representatives

Cable Address: Unico, St. Louis; A. B. C. and Western Union Codes





NATIONAL LEAD CO., St. Louis Works—Oxide Building—Unit Construction Co., Engineers;  
St. Louis Unit Construction Co., Contractors. This building is five stories high, 100x122 ft.  
Floor loads of two lower floors are 500 pounds to square foot. Upper floors 250 pounds



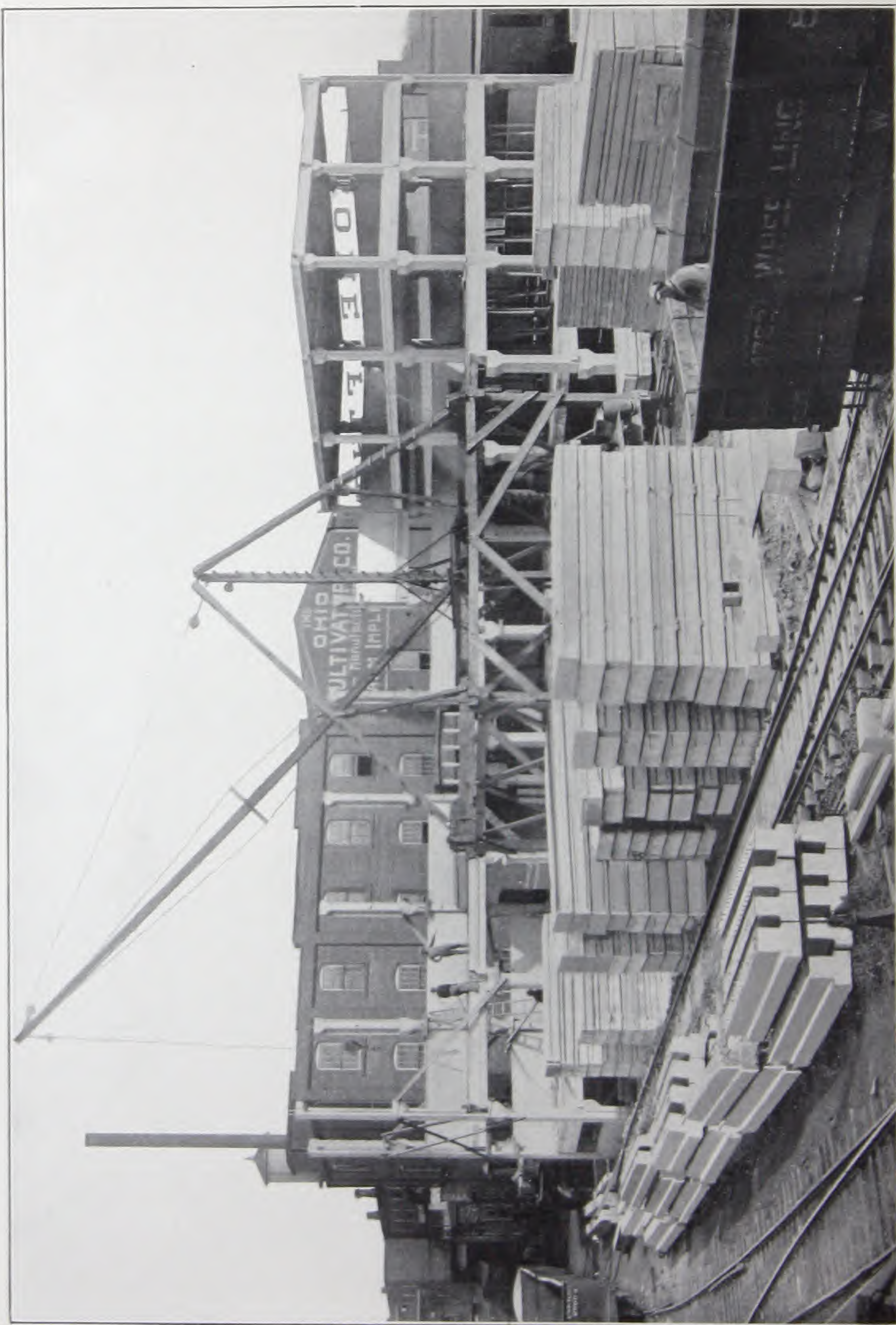
# UNIT CONSTRUCTION

THE world has progressed very slowly in devising new methods of building construction. Foremost in the developments of the past century are the adoption of steel skeleton construction in the so-called skyscrapers and the readoption of the ancient use of concrete in combination with steel reinforcing, which has produced remarkable improvements over ancient methods.

In spite of this advance, the world at large still uses the old method of depositing semi-liquid concrete in the wooden shell of the structure (subject to all the uncertainty and inaccuracy of this process). Some years ago it occurred to us that the modern ideas of factory-built precision and certainty could be applied to reinforced concrete methods, and "Unit-Bilt" construction is the result of this development.

Unit construction is a patented method of assembling materials, and erecting reinforced concrete buildings. It differs from the ordinary method of reinforced concrete construction in that all concrete is cast in forms on the ground, in the





OHIO CULTIVATOR CO., BELLEVUE, OHIO. C. P. Howard, Engineer, Cleveland, Ohio  
Every Unit moulded and seasoned on the ground before placing in the structure



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shape of individual units, which are seasoned and then assembled in place in the building as provided for in the design.

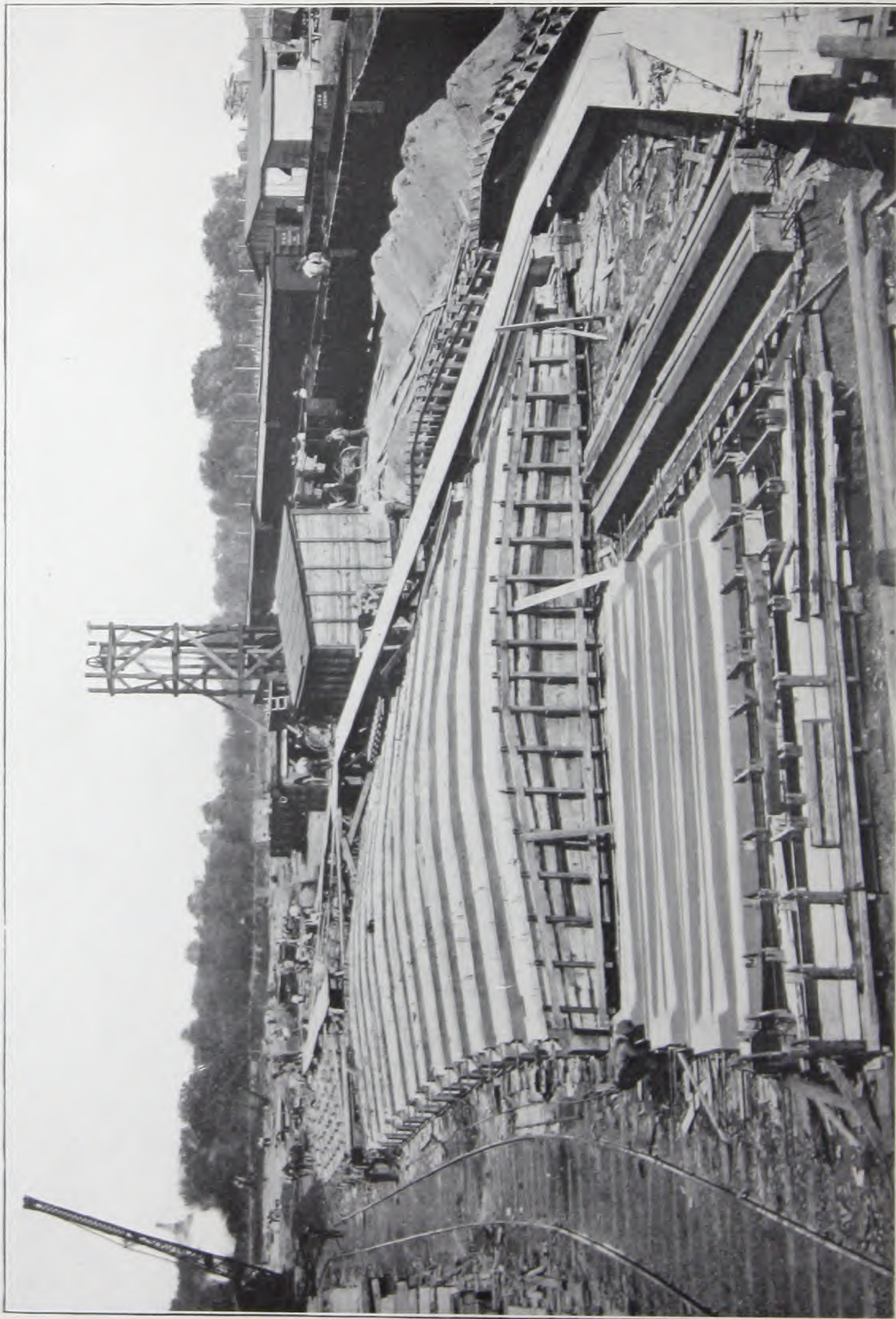
There is no difference in the materials used, the difference being only in the application of Unit Construction methods.

It has been clearly demonstrated that this difference in method produces many structural advantages, and also adds to the excellent appearance of the completed building.

These advantages may be briefly stated as follows:

- (1) Ease and completeness of inspection of every part of the structure during the entire process of casting and erection.
- (2) Certainty of accurate results, because the work is at all times open to view.
- (3) Simplicity of design.
- (4) Uniform quality of concrete.





View of "Unit" casting yard for car barns of PHILADELPHIA RAPID TRANSIT CO. (See page 20)  
Girders shown are 38 feet long



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- (5) Shrinkage stresses reduced to a minimum.
- (6) Joints at predetermined locations regardless of daily progress of work.
- (7) Reinforcement in the exact position intended by the Designing Engineer.
- (8) Maximum strength because of uniform quality.
- (9) Greater speed of erection is obtained because of the fact that the entire work can be organized in advance.
- (10) Excellent appearance of finished building.

An examination of the illustration on page 6 gives an example of a casting yard with work in progress, and shows how easy it is to inspect each unit as it is being cast. As this work is done on the ground, it is accessible and under supervision of competent superintendents. Under such close inspection there is practically no opportunity for sawdust, pieces of wood, or other foreign matter to remain in the forms.





NATIONAL ENAMELING & STAMPING COMPANY WAREHOUSE, Granite City, Ill.  
Note uniform concrete and perfect workmanship.



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In addition, if inspection shows that there is any reason to question the quality or strength of a unit, it is easy to make an individual test, thus making certain that all concrete which becomes part of the structure is above the standard in strength and appearance.

Every characteristic feature of design used in the "Unit-Bilt" system has been developed under laboratory tests until its strength has been proven beyond question.

The steel reinforcing is locked in position in the form, assuring that it will stay in the exact place called for in the design.

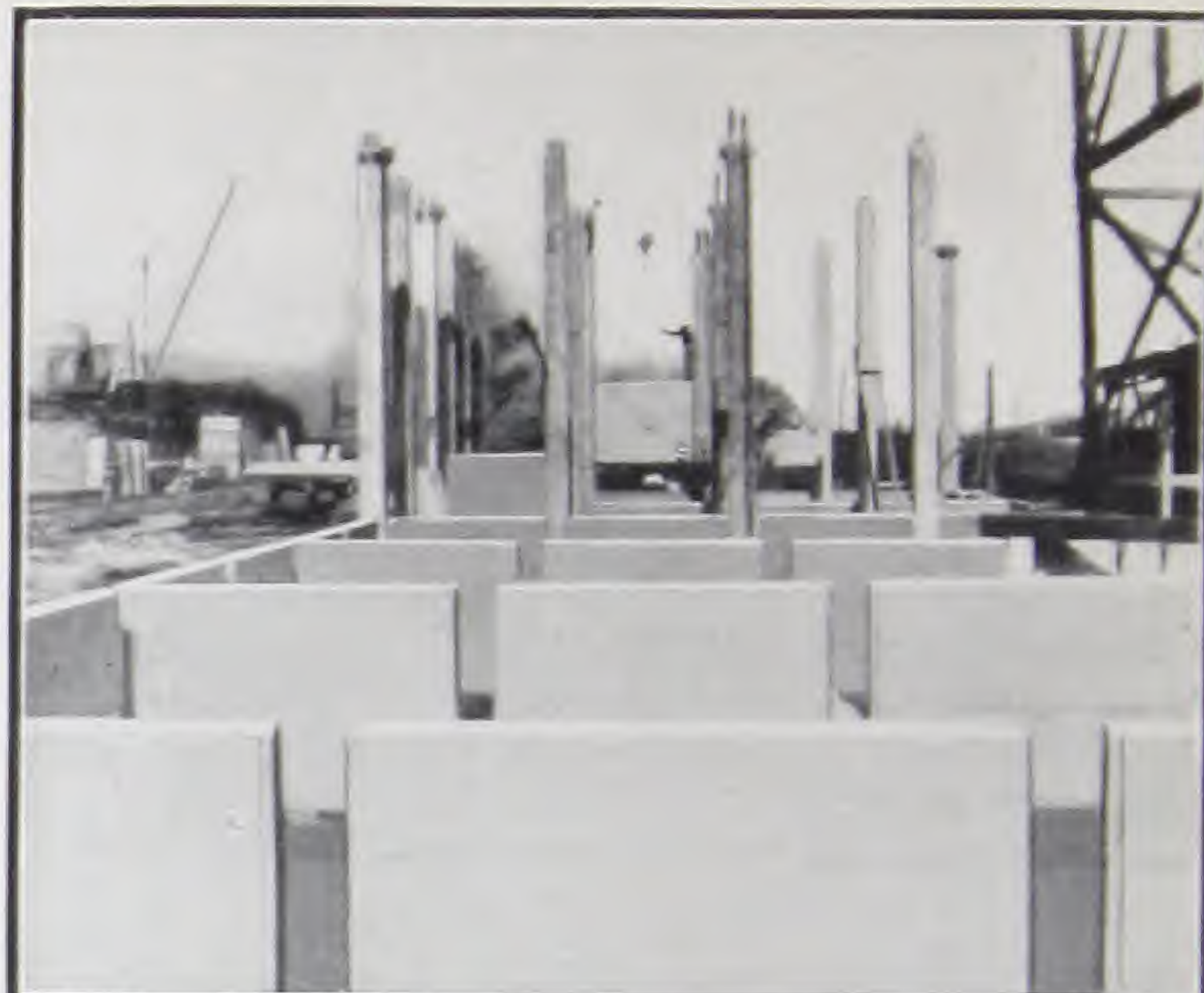
As every unit is allowed to "season" before erection, the concrete has shrunk before the unit becomes a part of the completed structure. In this way shrinkage stresses in a unit building are almost entirely eliminated.

In designing "Unit-Bilt" structures, all joints are at predetermined places and of maximum strength. Under ordinary methods of reinforced concrete construction, the location of joints is not

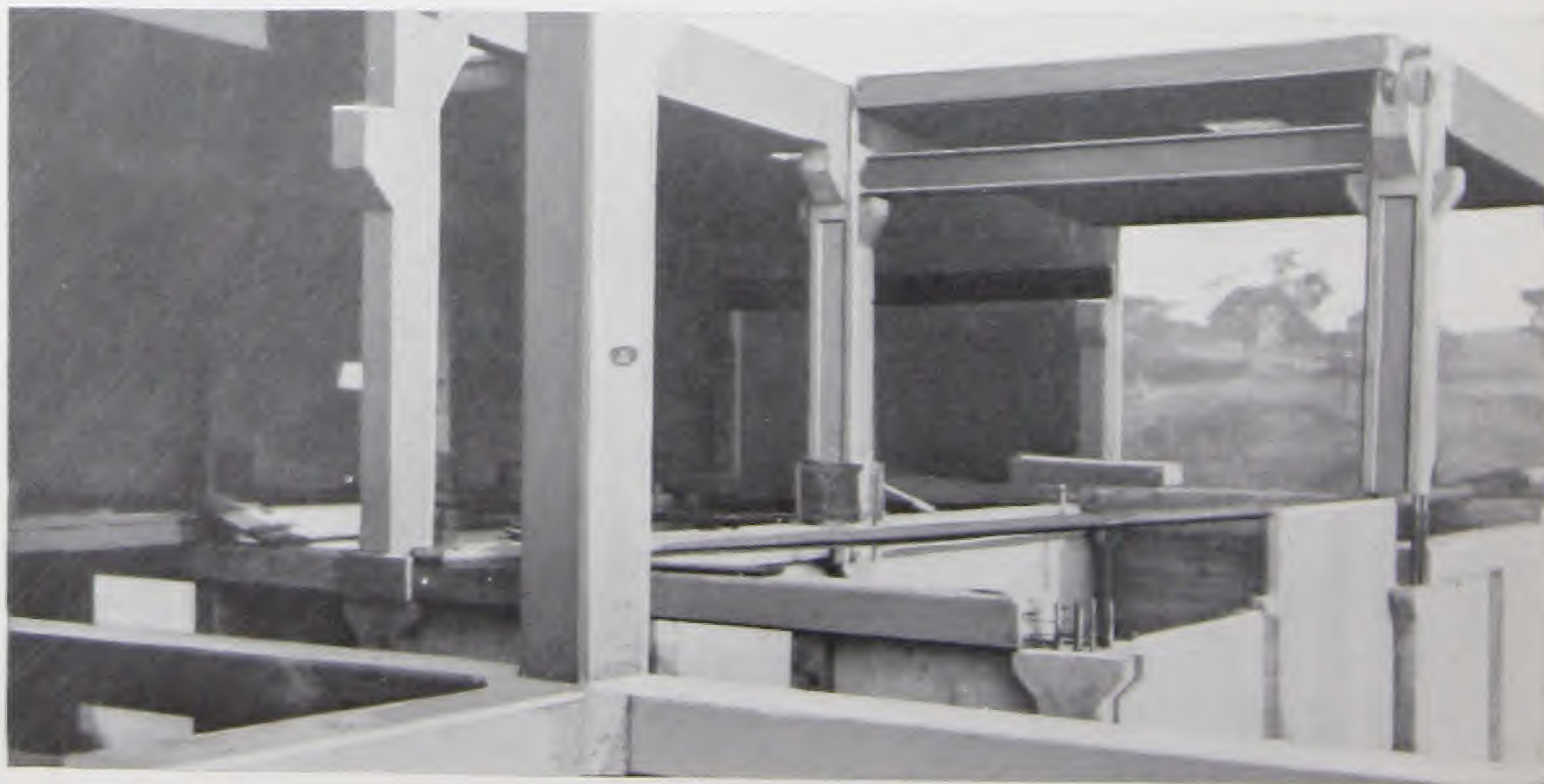




Accuracy, strength and perfect workmanship  
of all joints is certain



Illustrating the placing of columns and assembling of  
"skeleton" in "Unit-Bilt" Structures





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under the control of the Designing Engineer, but is subject to weather conditions and the daily progress of the work.

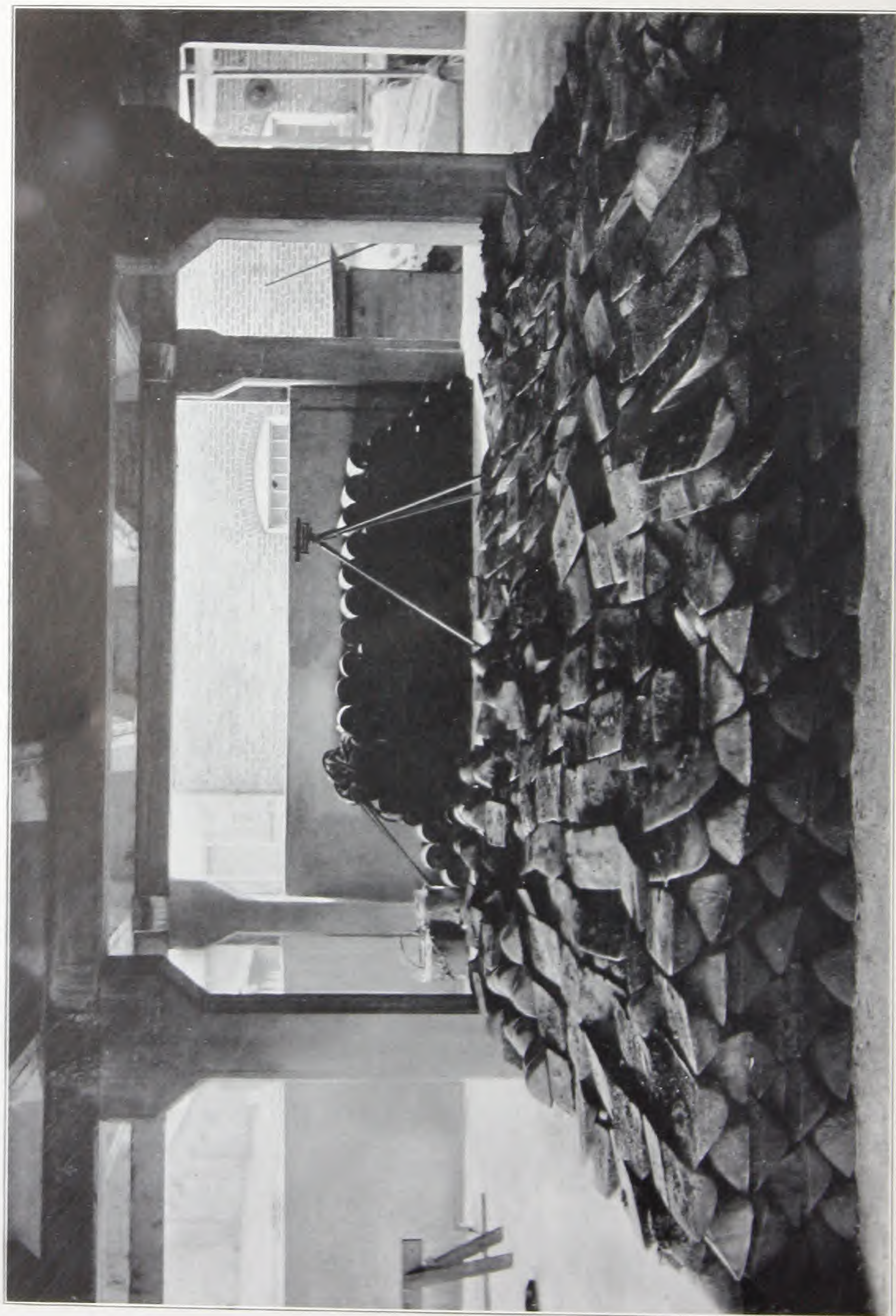
It is apparent that "Unit-Bilt" methods remove the objections often cited against reinforced concrete construction by insuring fullest inspection, greatest accuracy and by eliminating uncertainty, thereby securing the maximum strength for the structure.

The attractive ornamentation and surface finishes obtained by unit methods are shown in several illustrations.

The ease with which unit work is organized in advance insures rapid construction without sacrificing the quality of workmanship or the strength of the structure. Casting of units may commence when excavation is started so that units may be set as soon as the foundation is complete. As there is no centering to remove, the first story of the building is ready for occupancy as soon as the floor of the second story has been set.

The practical value of unit construction is proven by the forty-two buildings completed by





Test load on "Unit-Bilt" Floor. Panel 14 ft. x 16 ft. 4 in. floor. Load 120,000 lbs. Very slight deflection.



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these methods at this time, May, 1913; many of these have been in satisfactory service for several years. These buildings have cost no more than ordinary concrete structures and have many advantages over such buildings.

A glance at page 29 shows graphically the growth of "Unit-Bilt" construction, the complete and rapid success of which must be credited to the simple, accurate and certain methods used, and to our organization, developed by years of varied experience as contracting engineers for extensive undertakings in reinforced concrete construction. Our organization is one of international reputation, and is now handling large contracts for prominent corporations in the United States, Canada, and Mexico, including such work as viaducts, roundhouses, grain elevators, warehouses, electric railway car-barns, complete industrial and hydro-electric plants. We are prepared to complete undertakings of magnitude upon the most favorable terms consistent with modern engineering and contracting practice.





ST. LOUIS, MO.  
GRANITE CITY, ILL.  
NEW YORK  
MILWAUKEE, WIS.

BALTIMORE, MD.  
CHICAGO, ILL.  
NEW ORLEANS, LA.  
PHILADELPHIA, PA.

GRANITE CITY STEEL WORKS

*Granite City, Ill.* March 15, 1913.

Unit Construction Company,

801 Liggett Building,

St. Louis, Mo.

Gentlemen:

In reference to the "UNIT BILT" Warehouse which you constructed for us about a year ago we wish to advise that this building is satisfactory in every respect, and feel satisfied that your methods of concrete construction offer the best means of securing the highest class of reinforced concrete structure at a reasonable cost.

The building as constructed by you is absolutely fire-proof, and with your special arrangement of skylights has made it very satisfactory for the assorting of our tin plate and the storing of same.

Everyone who has inspected this building has commented on its excellent appearance and also its splendid lighting arrangement, and we hope in the future, as our various plants grow, that you will be in a position to construct them for us.

Very truly yours,  
NATIONAL ENAMELING & STAMPING CO.,

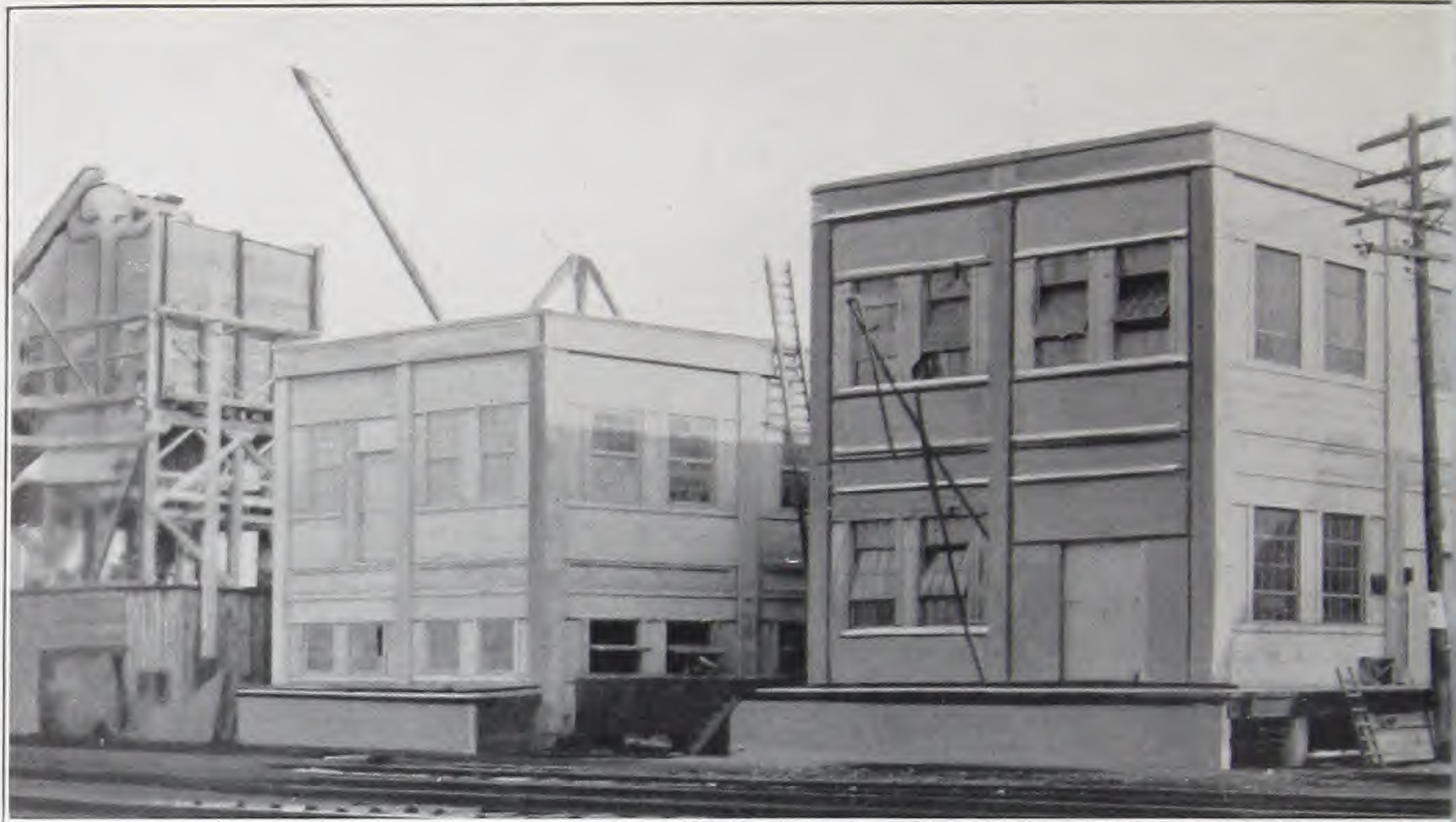
GWN

*George W. Livingston*  
Vice-President and Manager  
Steel Department.





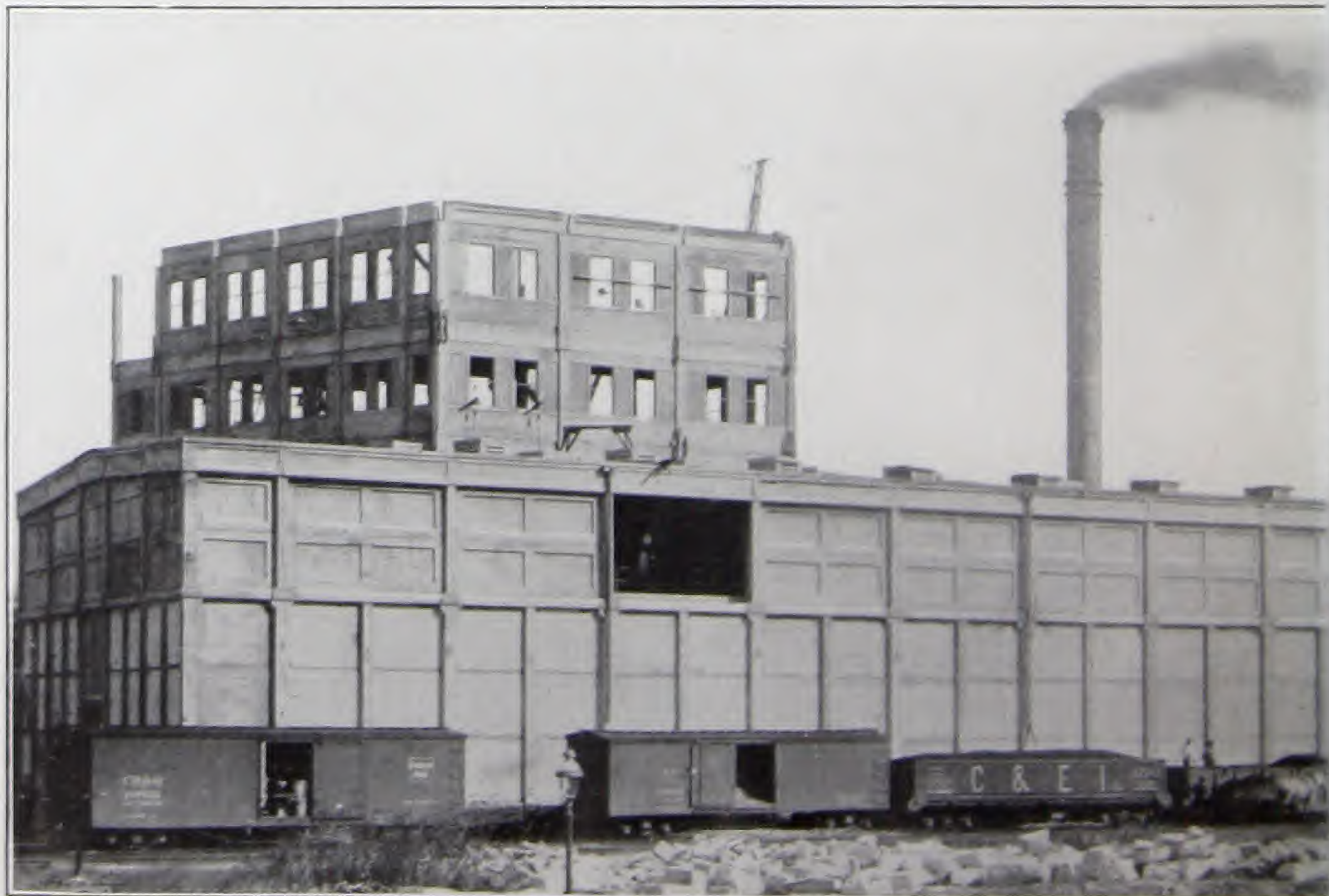




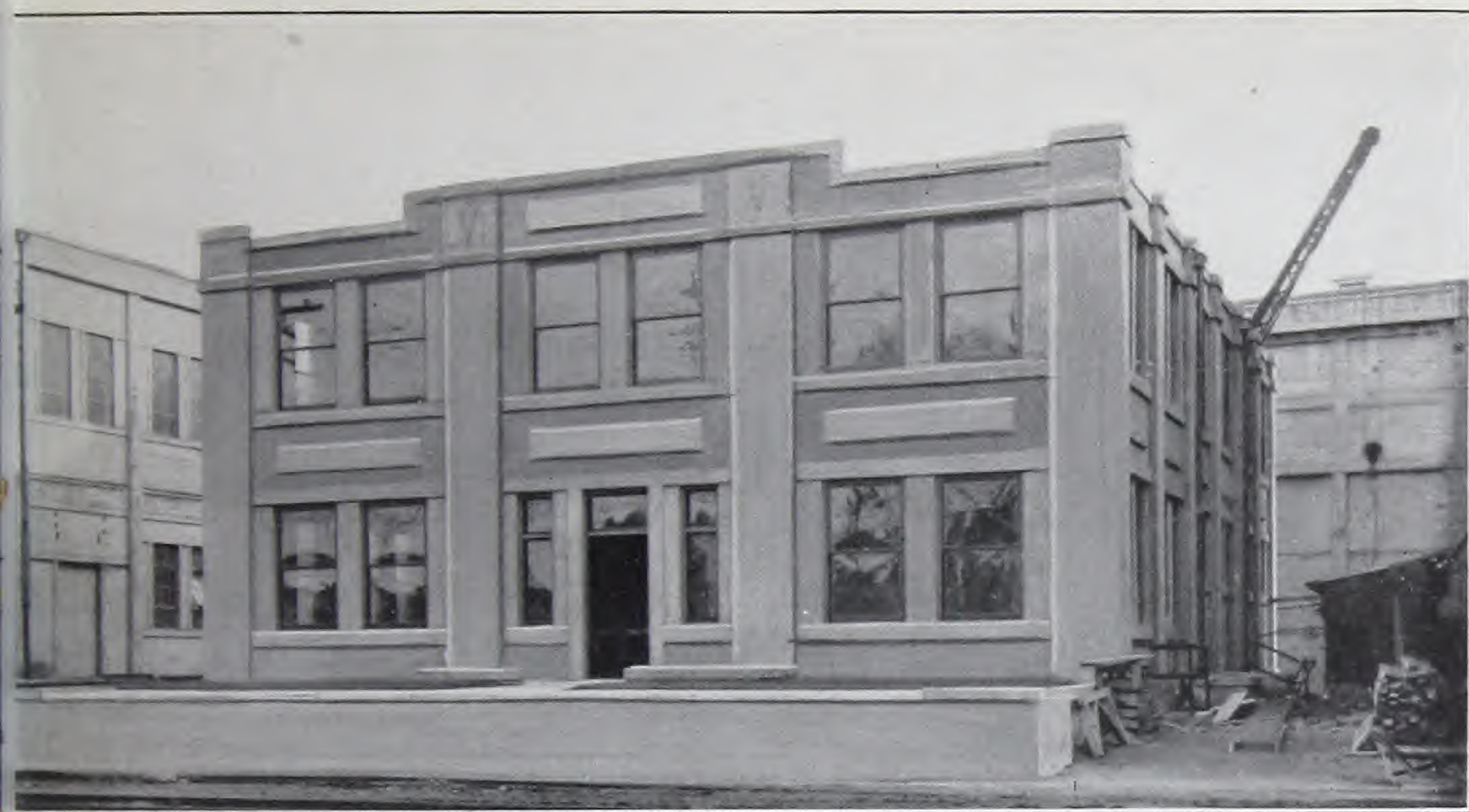
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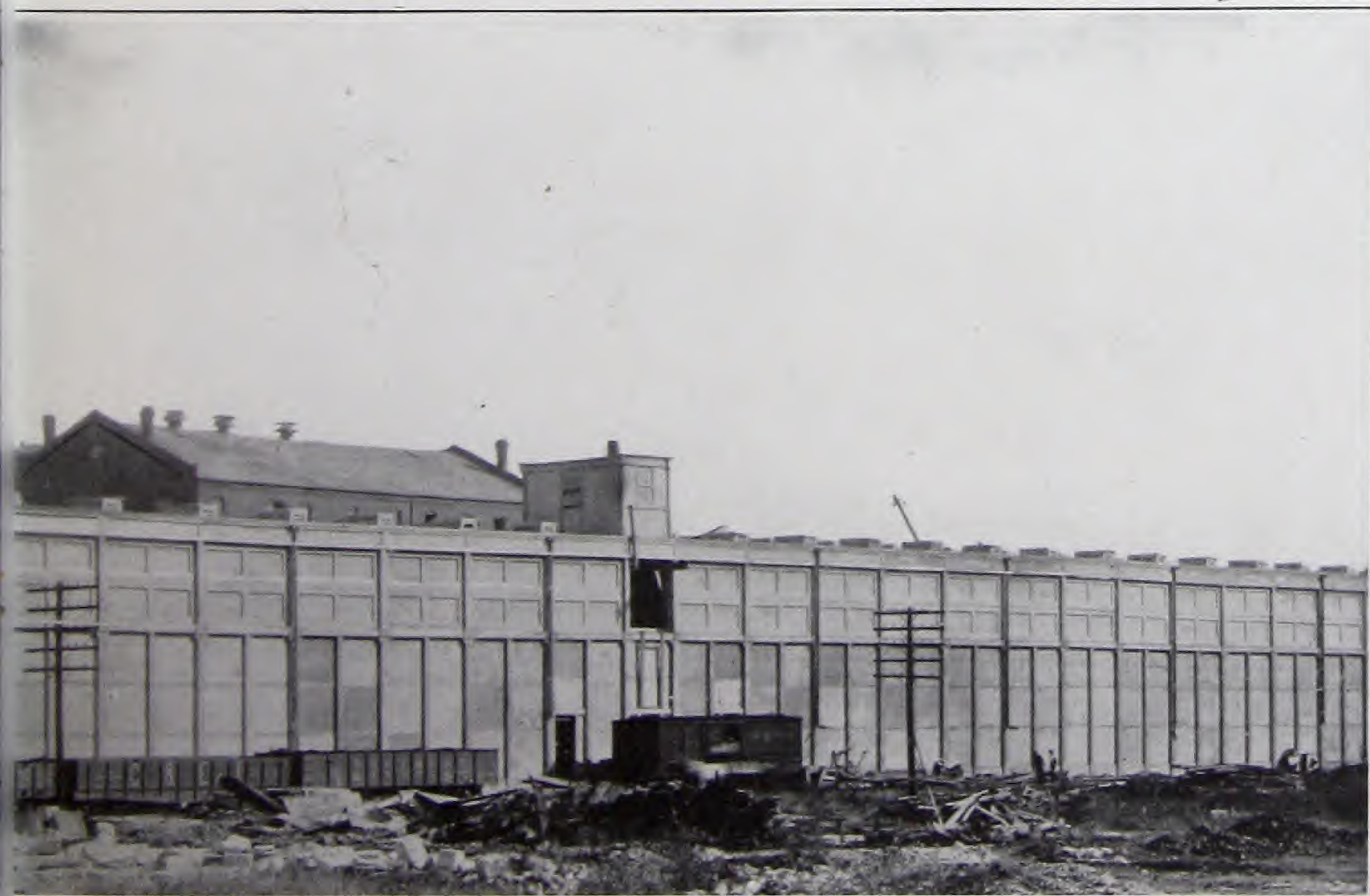




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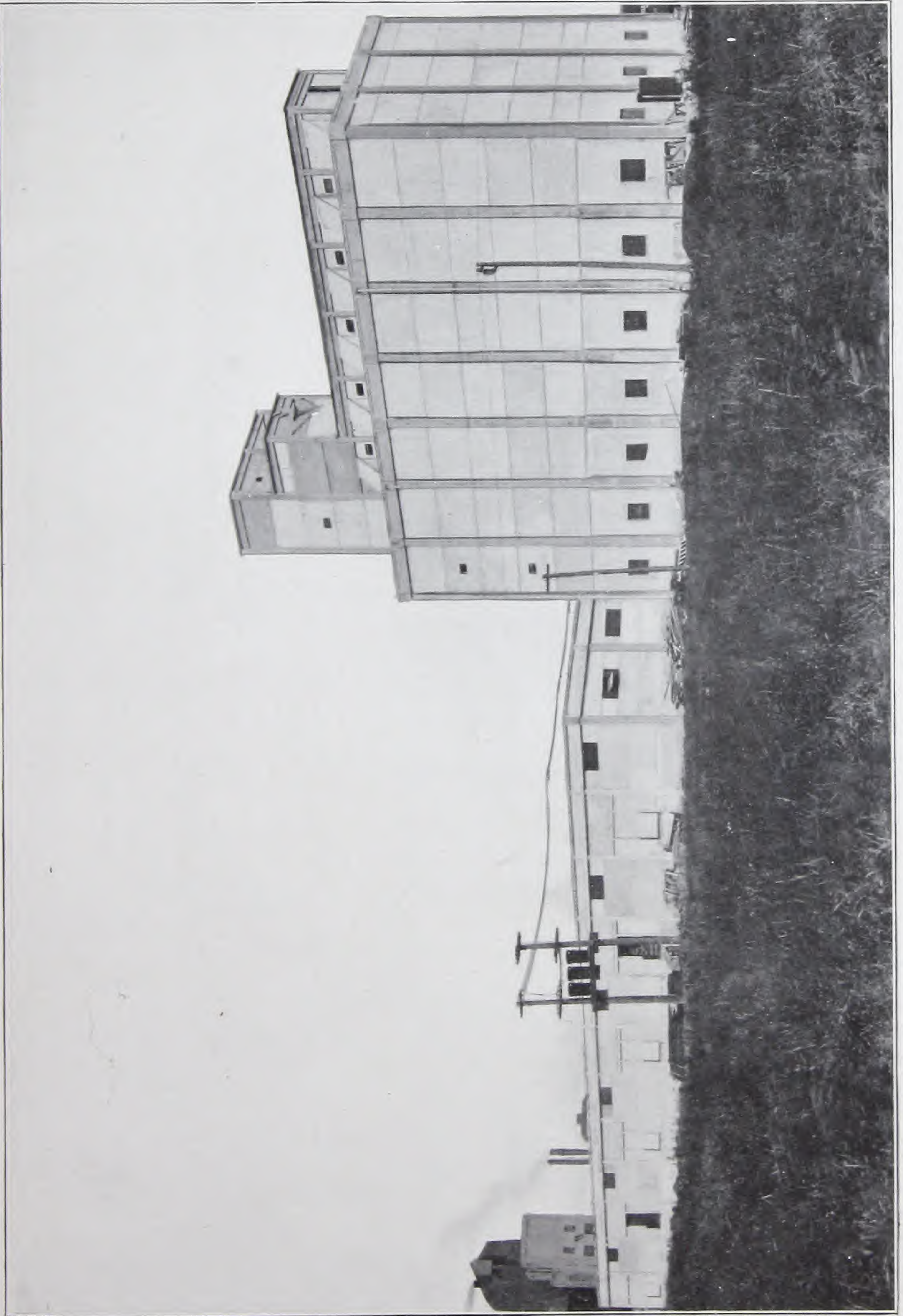






Elevator of HIGHLAND MILLING COMPANY, Highland, Ill.  
50,000 bushels capacity—"Unit-Bilt"





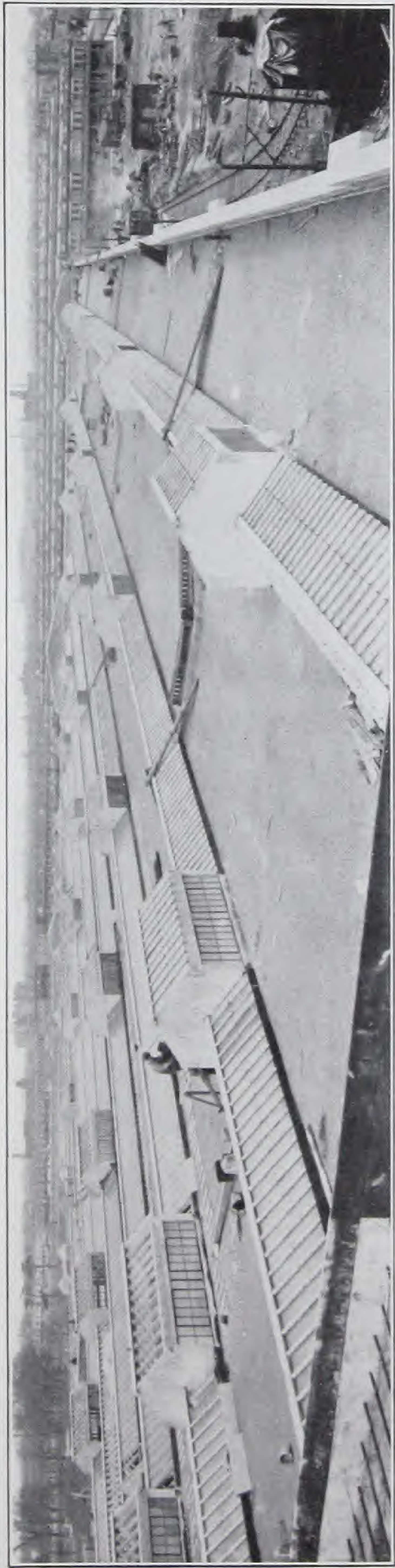
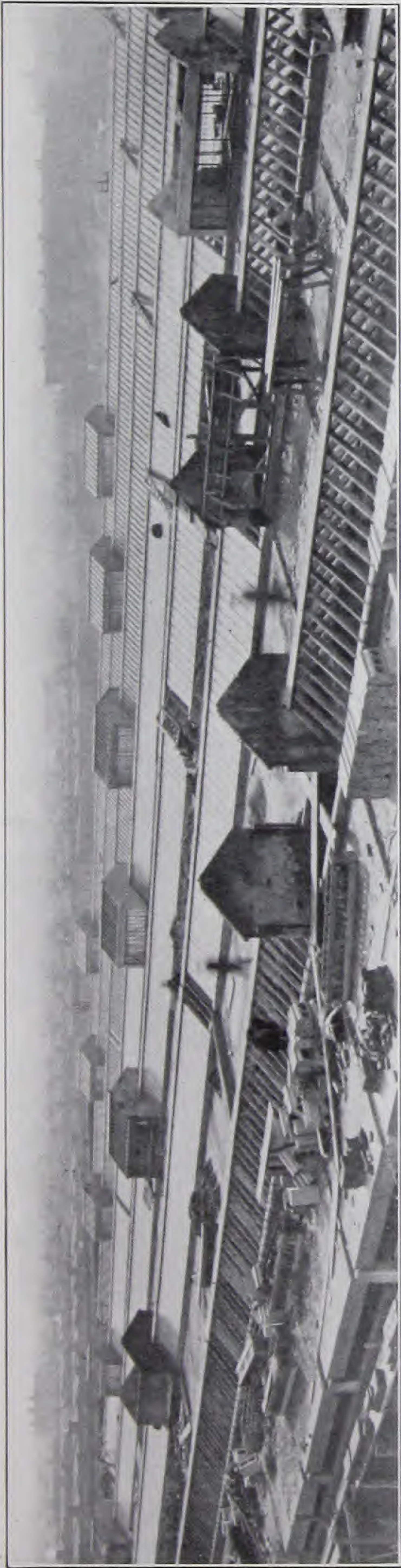
"Unit-Bilt" Elevator and Mill-feed Warehouse for CHAPIN & CO., Hammond, Ind., 100,000 bushels capacity





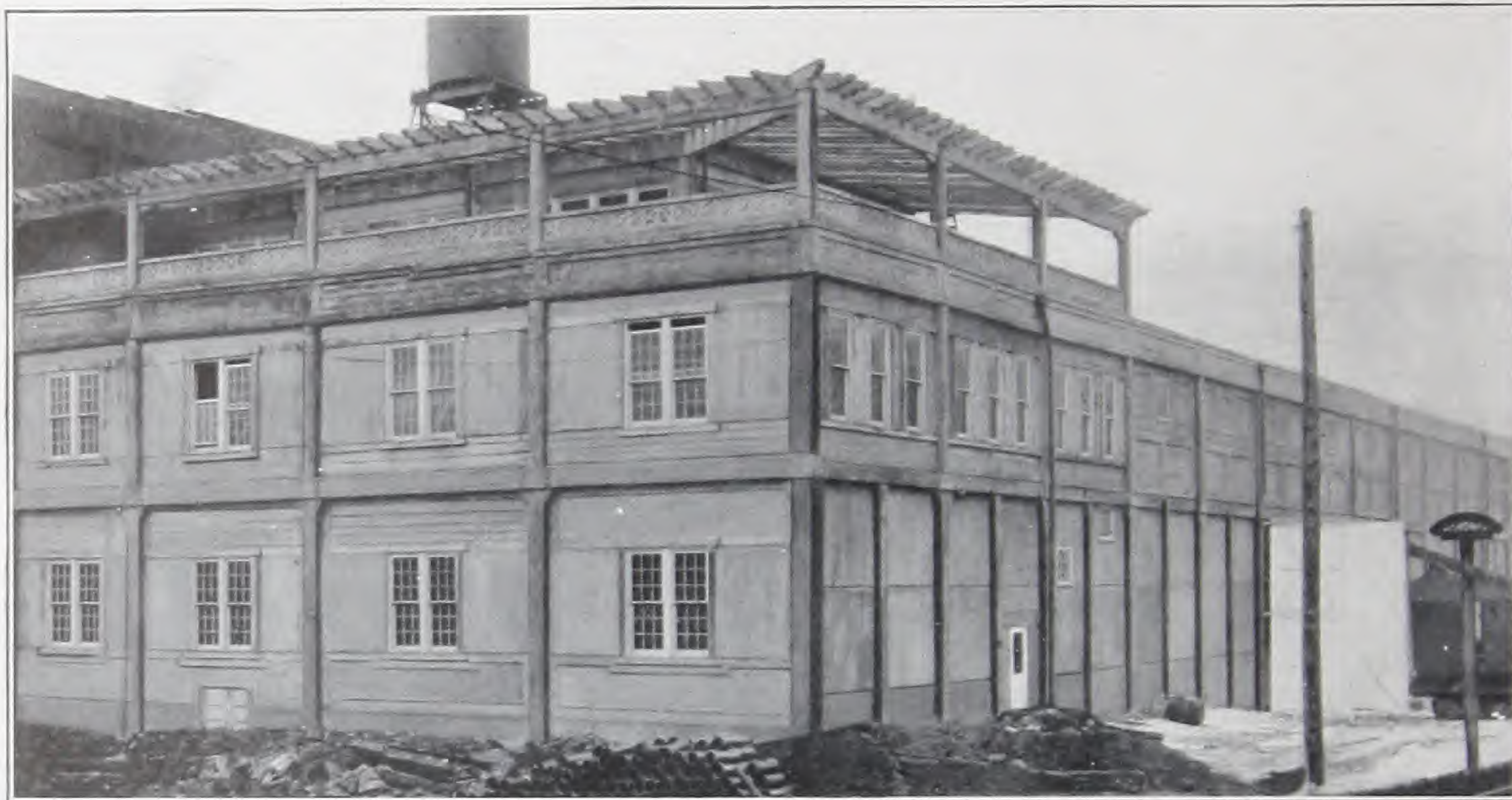
"Unit-Bilt" Car Barn for PHILADELPHIA RAPID TRANSIT COMPANY, Tenth and Luzerne Streets, Philadelphia  
H. B. Nichols, Chief Engineer; R. T. Senter, Superintendent Rolling Stock and Buildings; J. H. Frank, Architect. (See page 6)  
This structure is 375x611 feet—storage capacity, 366 cars





Two views of Roof of PHILADELPHIA RAPID TRANSIT CAR BARN showing concrete and wire glass skylights





This Building is the Corroding Building, Office and Employes' Welfare Department of NATIONAL LEAD & OIL COMPANY, New Kensington, Pa. The W. G. Wilkins Co., Engineers, Pittsburgh, Pa.

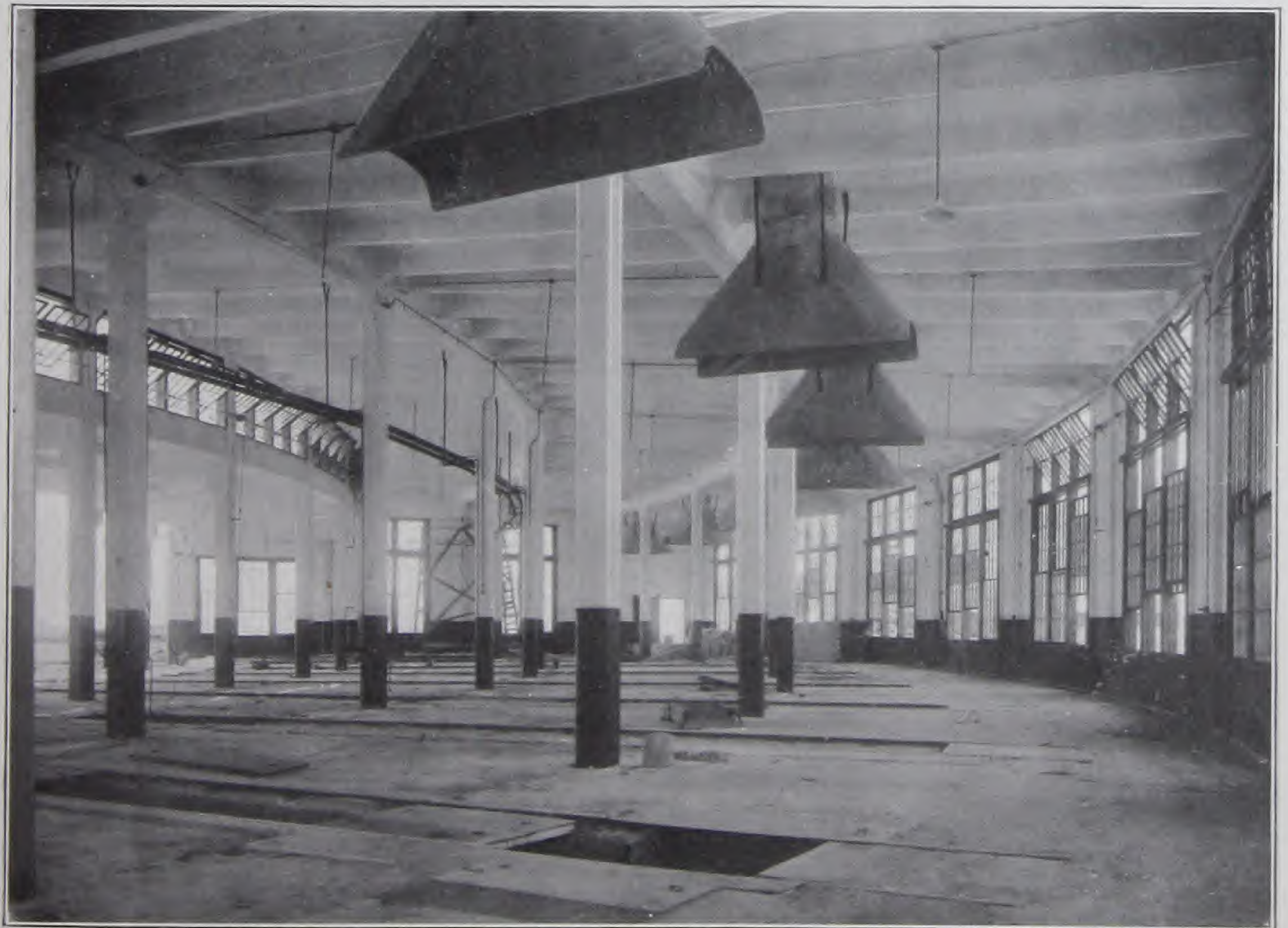


Elston Avenue Warehouse, Chicago, UNIVERSAL PORTLAND CEMENT CO.,  
100 ft. by 200 ft. Cement Warehouse, Office and Stable.



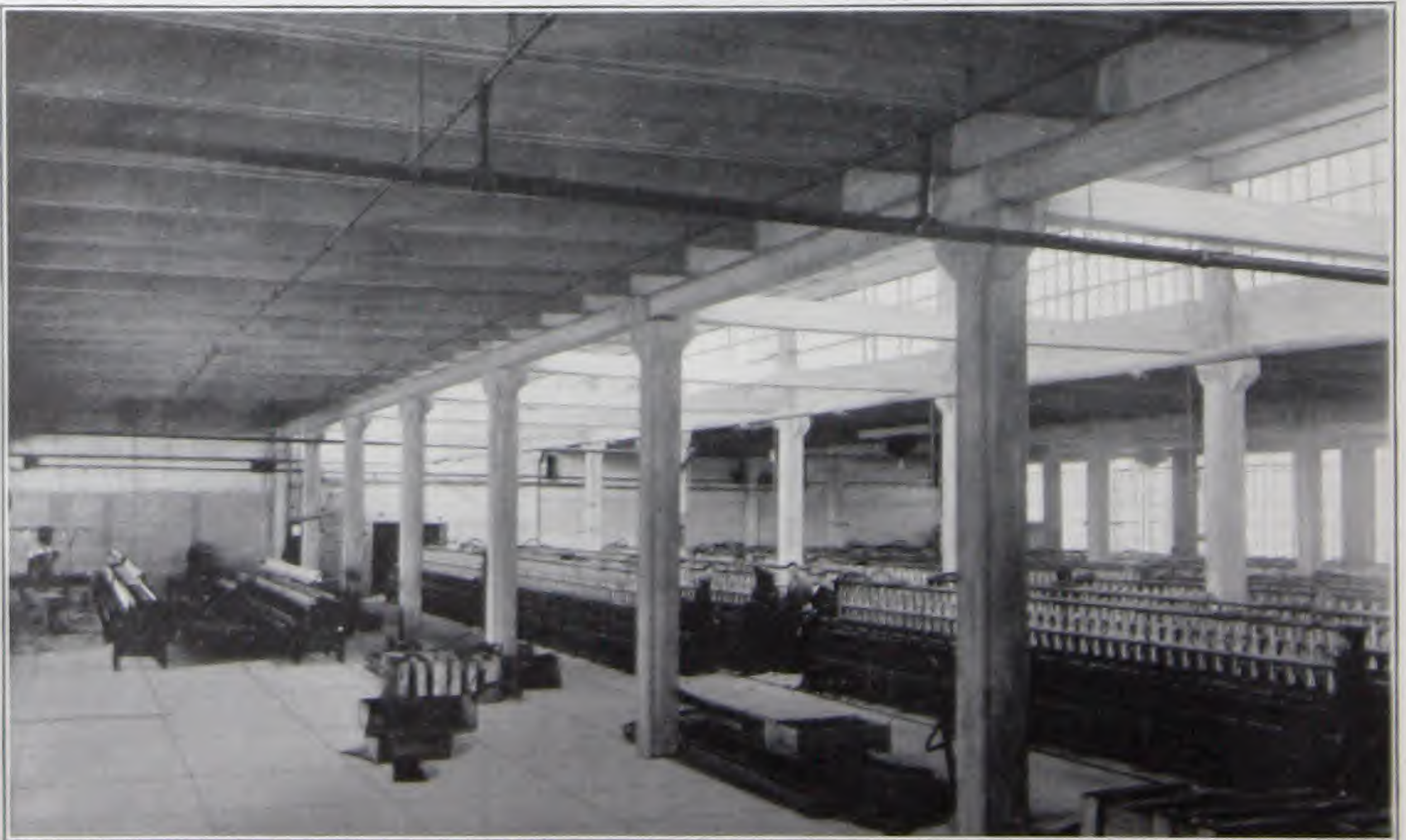
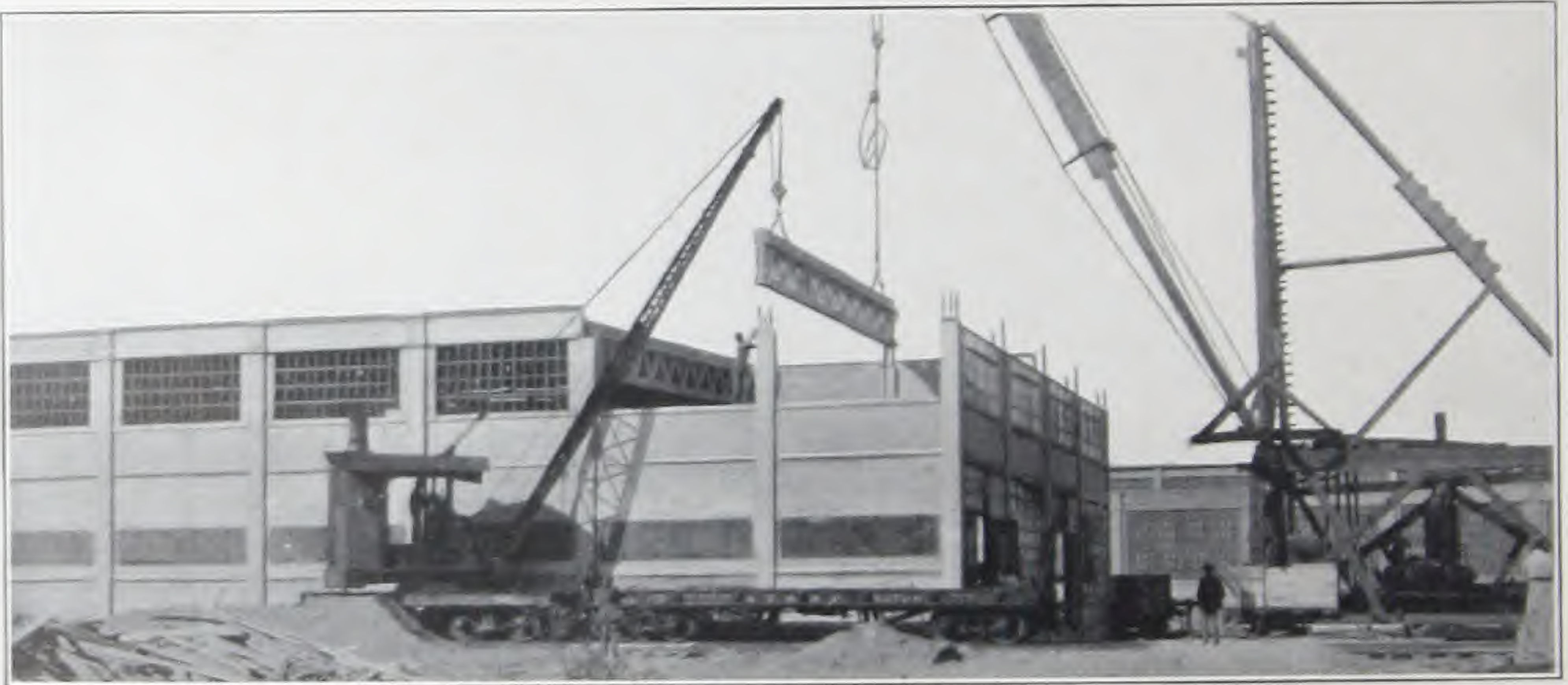


Fifteen-stall standard 92 ft. low type Roundhouse for A. T. & S. F. RAILWAY CO., Riverbank, Cal.  
C. A. Morse, Chief Engineer of System. Erected under supervision of H. C. Philips  
and G. W. Harris, Chief Engineers of Coast Lines

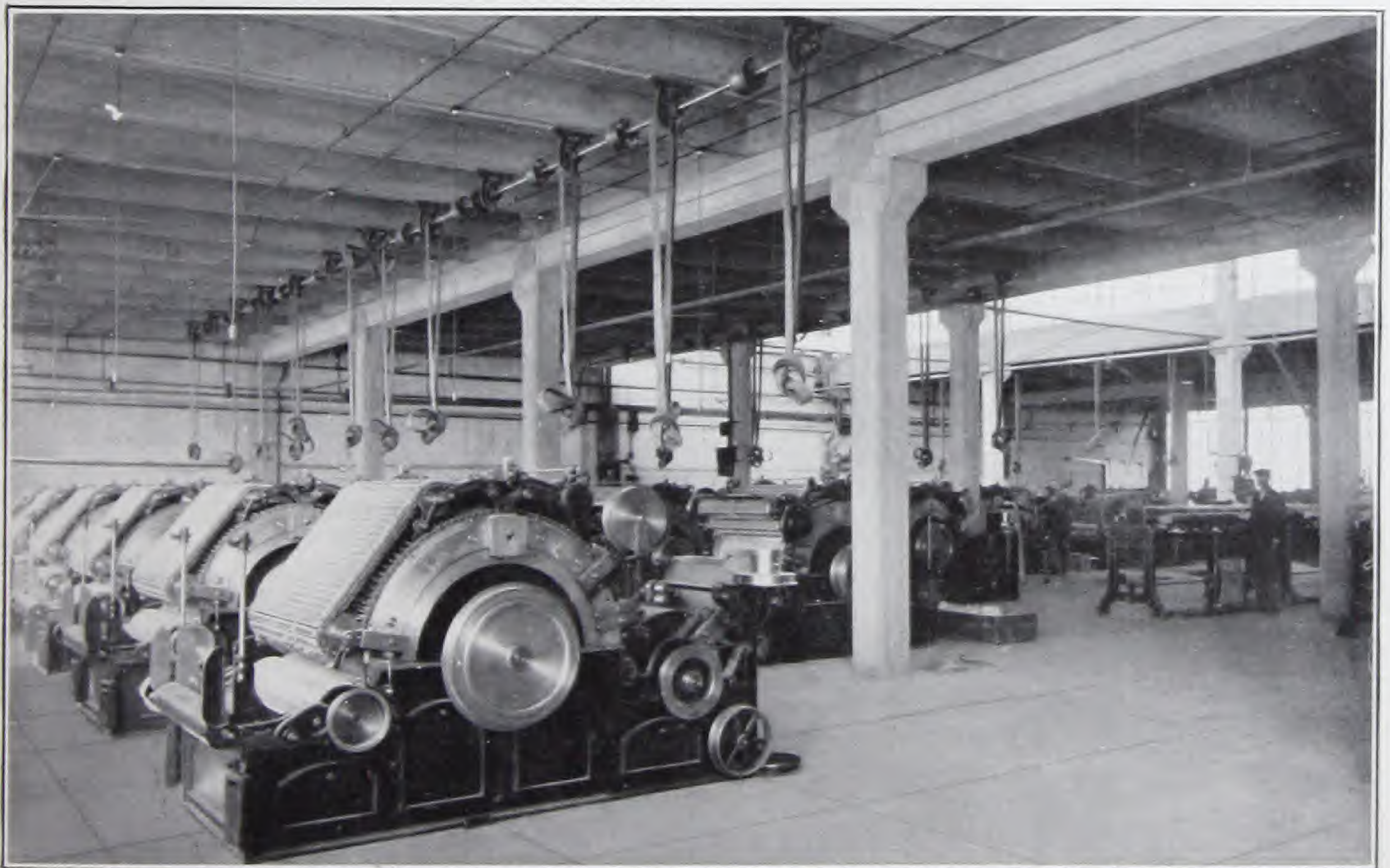
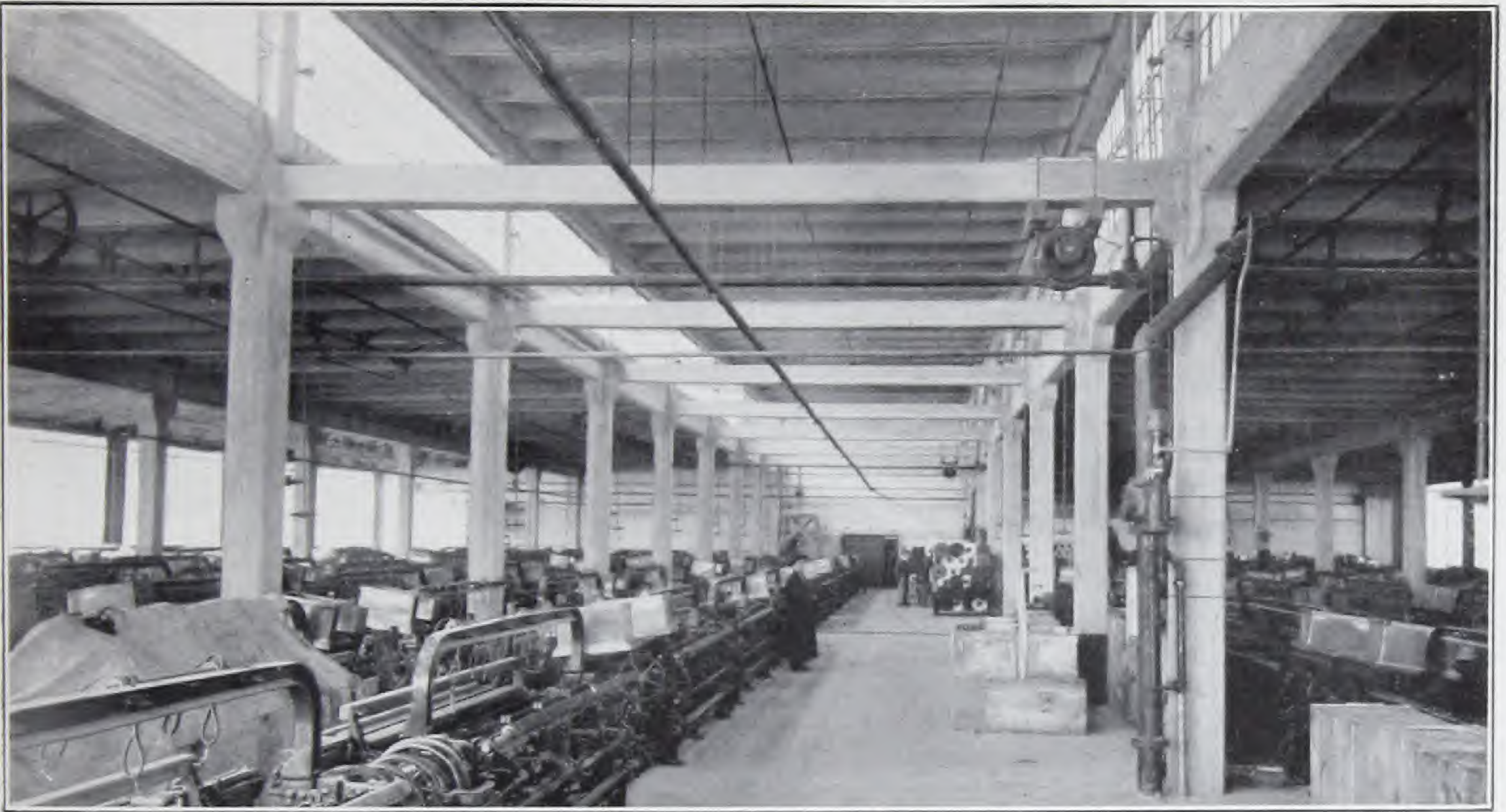


Interior view of SANTE FE ROUNDHOUSE, Riverbank, Cal.









The illustrations on these two pages show the "Unit-Bilt" structures of POSTEX COTTON MILLS COMPANY and the POST POWER COMPANY, of Post, Texas.

The cotton mills comprise the following buildings:

Main Mill, 521 x 133 ft., 25 ft. high.	Bleachery, 222 x 50 ft.
Warehouse, 200 x 102 ft., 17 ft. high.	Bleachery Wings, 101 x 50 ft.
Lint Cotton Bin, 101 x 52 ft., 17 ft. high.	Cotton Gin, 61 x 25 ft.

Cotton taken from the field leaves this mill as finished goods. Power-house is 143 ft. by 84 ft. with spans of 42 ft. The power plant supplies power to this industry and the city of Post.

It is interesting to note that the girders, one of which is shown going into place in the middle illustration on page 24, are 42 ft. in length.



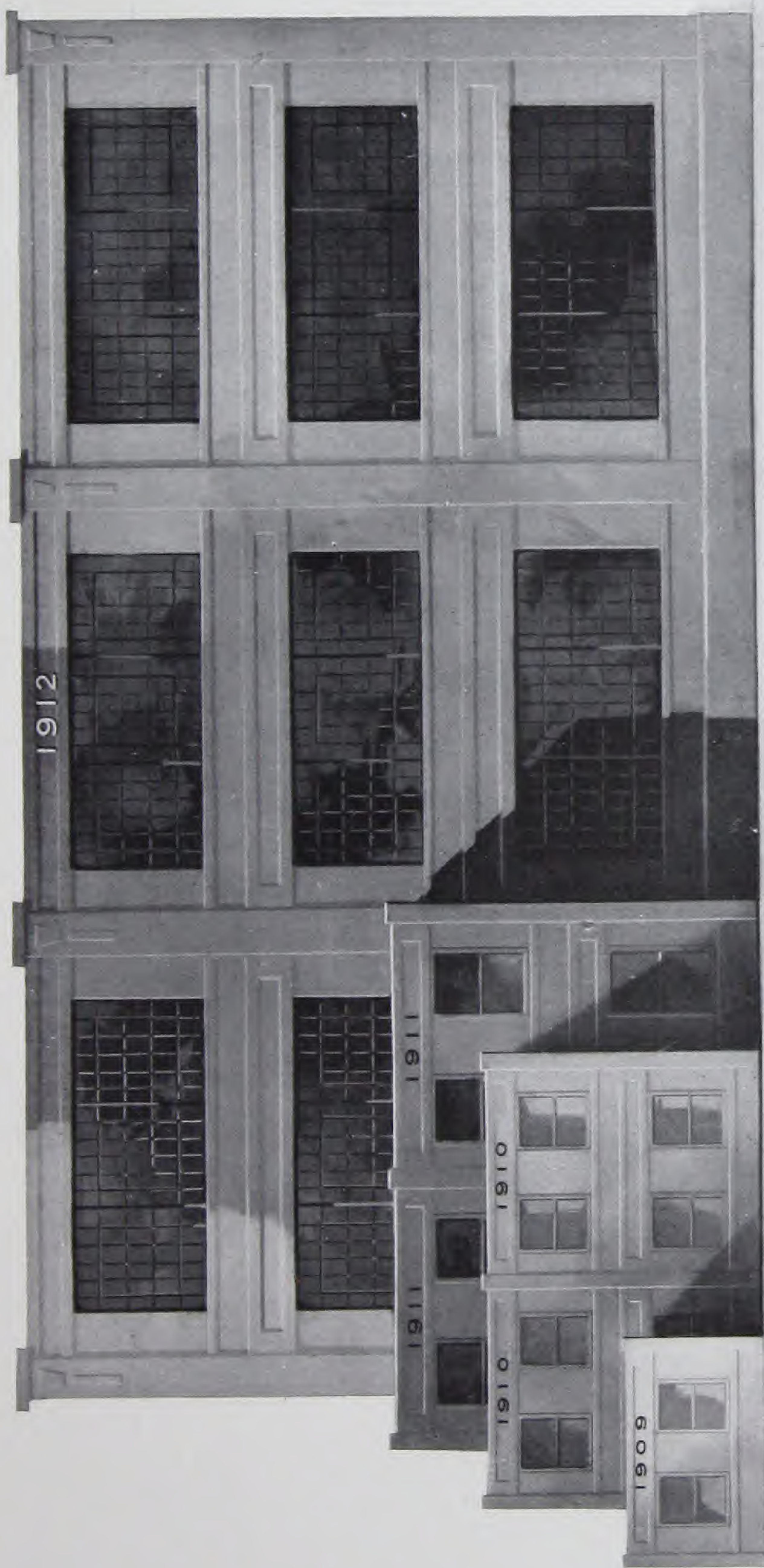


STURGES & BURN MFG. CO. FACTORY Bellwood, Ill. A Saw-Tooth Roof Factory "Unit-Bilt"



View of Saw-Tooth Roof on Factory shown above





This drawing graphically illustrates the conservative, but rapid growth of demand for "Unit-Bilt" methods.

In 1909 the amount of "Unit-Bilt" construction was only 50,250 square feet; in 1910, 204,250 square feet; in 1911, 275,000 square feet, and in 1912, 1,300,000 square feet. These figures refer to floor areas.

Business under contract for 1913 indicates that this record of growth will be fully maintained and this steady advancement shows that as practical engineers and builders become fully acquainted with the advantages of this method they are glad to avail themselves of it.





Birdseye drawing of Cotton Handling and Storage Plant of MEMPHIS TERMINAL CORPORATION, Memphis, Tenn.—B. L. Mallory, Pres., W. G. Turner Vice-Pres't and Gen'l Mgr. J. A. Omberg, Jr., Consulting Engineer. This is the largest fireproof plant of this character in the United States, comprising nearly fifty acres of buildings, of which about one-third have been constructed under "Unit-Bilt" methods, these being the most recent additions to the plant



